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- (71) Applicant (*for all designated States except US*): MILLIPORE CORPORATION [US/US]; 290 Concord Road, Billerica, MA 01821 (US). Published:  
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- (72) Inventors; and  
(75) Inventors/Applicants (*for US only*): GABRIELS, Joseph, E., Jr. [US/US]; 41 Cleveland Street, Arlington, For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COMPOSITIONS OF SOLUTION FOR SEQUENCING REACTION CLEAN-UP

(57) Abstract: Wash solution and method for purifying sequencing reaction product. The wash solution comprises an effective amount of guanidine in a low ionic solution to reduce or eliminate the presence of dye terminators in a sequencing reaction product. In its method aspects, the present invention comprises the addition of the wash solution to the sequencing reaction product prior to filtration, followed by filtration to reduce or eliminate unincorporated dye terminators. The purified sequencing products can then be resuspended and transferred to an appropriate substrate for sequencing or further preparation. Dye blobs formed from unincorporated dye terminators no longer interfere with the electropherograms generated upon electrophoresis of the sample.

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# INTERNATIONAL SEARCH REPORT

Internat Application No  
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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 C12Q1/68 C12N15/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C12Q C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, EMBASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 22021 A (BASTIAN HELGE ; GAUCH SIMONE (DE); OELMUELLER UWE (DE); ULLMANN SUS) 6 May 1999 (1999-05-06) page 9, line 5 - line 15	7, 15
Y	page 8, line 25 - page 13, line 31 claims 26-49; example 8	1-6
X	WO 02 44414 A (PROMEGA CORP) 6 June 2002 (2002-06-06) page 12, line 31 - page 13, line 6; example 2	7, 9, 12
Y	page 12, line 31 - page 14, line 22	1-6
X	WO 01 09389 A (MOLECULAR DYNAMICS INC) 8 February 2001 (2001-02-08) abstract; claims 17, 18	7, 9
Y	page 25, line 31 - page 26, line 31; example 4	1-6
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☒ Further documents are listed in the continuation of box C.

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# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 03/26557

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 292 869 A (SCHRYVERS ANTHONY B) 8 March 1994 (1994-03-08) column 9, line 3 - line 6 ---	7-9
X	WO 86 04583 A (UPJOHN CO) 14 August 1986 (1986-08-14) page 5, line 27 - line 28 ---	7,9,11
X	US 2002/098192 A1 (LEE LIHSYNG STANDFORD ET AL) 25 July 2002 (2002-07-25) paragraph '0320! ---	7,9,13
X	US 6 288 123 B1 (KATRAGADDA SUBBARAO ET AL) 11 September 2001 (2001-09-11) column 70, line 33 - line 37 ---	7,9,14
X	US 6 165 770 A (ANTRANIKIAN GARABED ET AL) 26 December 2000 (2000-12-26) column 26, line 25 - line 26 ---	7,9,15
X	US 6 114 388 A (GEFFARD MICHEL) 5 September 2000 (2000-09-05) column 13, line 40 - line 41 ---	7,9,15
Y	WO 01 19482 A (MILLIPORE CORP) 22 March 2001 (2001-03-22) the whole document ---	1-6
Y	VOGELSTEIN B ET AL: "PREPARATIVE AND ANALYTICAL PURIFICATION OF DNA FROM AGAROSE" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE USA, NEW YORK, NY, US, vol. 76, no. 2, 1 February 1979 (1979-02-01), pages 615-619, XP000607195 the whole document ---	1-6
P,X	WO 03 058196 A (BIOARRAY SOLUTIONS LTD) 17 July 2003 (2003-07-17) page 53, line 19 - line 21 -----	7-9

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 03/26557

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9922021	A	06-05-1999	DE 19746874 A1 AU 1231899 A WO 9922021 A1 WO 0024927 A1 EP 1049801 A1 JP 2001520894 T US 2003152974 A1	29-04-1999 17-05-1999 06-05-1999 04-05-2000 08-11-2000 06-11-2001 14-08-2003
WO 0244414	A	06-06-2002	AU 1778402 A EP 1339876 A2 WO 0244414 A2	11-06-2002 03-09-2003 06-06-2002
WO 0109389	A	08-02-2001	US 6423536 B1 AU 6512700 A AU 6514700 A CA 2379969 A1 CA 2380794 A1 CN 1373813 T DE 20022783 U1 EP 1200191 A1 EP 1203099 A2 GB 2368032 A ,B JP 2003505711 T JP 2003505110 T WO 0108802 A1 WO 0109389 A2 US 2002110900 A1 US 2003032052 A1 US 6489112 B1	23-07-2002 19-02-2001 19-02-2001 08-02-2001 08-02-2001 09-10-2002 14-08-2002 02-05-2002 08-05-2002 24-04-2002 12-02-2003 12-02-2003 08-02-2001 08-02-2001 15-08-2002 13-02-2003 03-12-2002
US 5292869	A	08-03-1994	AT 173935 T AU 649950 B2 AU 5526190 A CA 2051808 A1 WO 9012591 A1 DE 69032806 D1 DE 69032806 T2 DK 528787 T3 EP 0528787 A1 ES 2127184 T3 IL 94228 A KR 240974 B1 NZ 233471 A NZ 247967 A IL 127163 A JP 4506794 T JP 3335622 B2 JP 2002316942 A US 6060058 A US 5141743 A ZA 9003234 A	15-12-1998 09-06-1994 16-11-1990 28-10-1990 01-11-1990 14-01-1999 05-08-1999 16-08-1999 03-03-1993 16-04-1999 19-03-2001 01-08-2000 25-11-1993 24-02-1995 10-11-2002 26-11-1992 21-10-2002 31-10-2002 09-05-2000 25-08-1992 27-02-1991
WO 8604583	A	14-08-1986	EP 0210228 A1 JP 62501632 T WO 8604583 A1 US 4795812 A	04-02-1987 02-07-1987 14-08-1986 03-01-1989
US 2002098192	A1	25-07-2002	US 2002061307 A1	23-05-2002

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/26557

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002098192 A1		AU 7266698 A	24-11-1998
		AU 7266898 A	24-11-1998
		EP 0979102 A1	16-02-2000
		EP 0981548 A1	01-03-2000
		JP 2002505574 T	19-02-2002
		JP 2002516610 T	04-06-2002
		US 6323322 B1	27-11-2001
		WO 9848837 A1	05-11-1998
		WO 9849198 A1	05-11-1998
		US 2002155498 A1	24-10-2002
		US 2002161201 A1	31-10-2002
US 6288123 B1	11-09-2001	AU 1912595 A	21-08-1995
		EP 0751767 A1	08-01-1997
		JP 9509156 T	16-09-1997
		US 6174924 B1	16-01-2001
		US 6143791 A	07-11-2000
		AU 3222699 A	22-07-1999
		CA 2182302 A1	10-08-1995
		WO 9520950 A1	10-08-1995
		ZA 9500878 A	16-01-1996
US 6165770 A	26-12-2000	AU 4376497 A	17-04-1998
		CN 1231693 A	13-10-1999
		WO 9813481 A1	02-04-1998
		EP 0939801 A1	08-09-1999
US 6114388 A	05-09-2000	FR 2727117 A1	24-05-1996
		AT 202487 T	15-07-2001
		AU 694825 B2	30-07-1998
		AU 4181196 A	17-06-1996
		CA 2205557 A1	30-05-1996
		DE 69521521 D1	02-08-2001
		DE 69521521 T2	25-04-2002
		DK 792167 T3	29-10-2001
		EP 0792167 A1	03-09-1997
		ES 2161915 T3	16-12-2001
		WO 9615810 A1	30-05-1996
		GR 3036710 T3	31-12-2001
		JP 10511643 T	10-11-1998
		NZ 297040 A	28-05-1999
		PT 792167 T	28-12-2001
WO 0119482 A	22-03-2001	US 6498240 B1	24-12-2002
		AU 8038500 A	17-04-2001
		DE 1218076 T1	28-11-2002
		EP 1218076 A2	03-07-2002
		JP 2003509036 T	11-03-2003
		WO 0119482 A2	22-03-2001
		US 2002102593 A1	01-08-2002
		US 2003023076 A1	30-01-2003
WO 03058196 A	17-07-2003	WO 03058196 A2	17-07-2003